

CLAIMS

What is claimed is:

- 1 1. An apparatus for isolating a device from a bus without interrupting system operation,
2 the apparatus comprising:

3 bus interface logic in communication with the bus, the bus interface logic
4 generating a signal indicating the status of the bus;

5 an isolation switch in communication with the bus; and

6 isolation control logic in communication with the bus interface logic and the
7 isolation switch,

8 wherein the isolation control logic transmits an isolation switch control signal
9 to the isolation switch in response to the generated bus status signal and a
10 received device isolation signal.
- 1 2. The apparatus of claim 1 wherein the bus interface logic comprises a state machine.
- 1 3. The apparatus of claim 1 wherein the bus interface logic comprises combinatorial
2 logic.
- 1 4. The apparatus of claim 1 wherein the bus interface logic monitors all bus transactions.
- 1 5. The apparatus of claim 1 wherein the bus status signal generated by the bus interface
2 logic indicates that the bus is idle.
- 1 6. The apparatus of claim 1 wherein the isolation control logic comprises combinatorial
2 logic.
- 1 7. The apparatus of claim 1 wherein the isolation control logic receives the device
2 isolation signal from logic monitoring the operational status of the system.
- 1 8. The apparatus of claim 1 wherein the isolation control logic receives the device
2 isolation signal from a hot-plug logic element.

- 1 9. The apparatus of claim 8 wherein the hot-plug logic element generates the device
2 isolation signal responsive to the physical removal of the device from its slot.
- 1 10. The apparatus of claim 1 wherein the isolation control logic receives the device
2 isolation signal from protocol checker logic monitoring the validity of bus
3 transactions.
- 1 11. The apparatus of claim 10 wherein the protocol checker logic generates the device
2 isolation signal responsive to a detected protocol violation.
- 1 12. The apparatus of claim 10 wherein the bus transactions are communicated on the bus
2 in relation to clock cycles.
- 1 13. The apparatus of claim 12 wherein the protocol checker logic generates the device
2 isolation signal during the same clock cycle as the detected protocol violation.
- 1 14. The apparatus of claim 1 wherein the bus status signal is a bus idle status signal.
- 1 15. The apparatus of claim 1 wherein the isolation control logic comprises a timer
2 measuring elapsed time.
- 1 16. The apparatus of claim 15 wherein the timer measures elapsed time relative to a
2 system event.
- 1 17. The apparatus of claim 16 wherein a timeout signal is generated in response to the
2 elapsed time exceeding a predetermined threshold.
- 1 18. The apparatus of claim 17 wherein the isolation control logic transmits a bus reset
2 signal responsive to receiving both the device isolation signal and the timeout signal
3 from the timer.

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- 1 19. In a system having a bus controlled by a bus controller and having at least one bus
2 device in communication with the bus via an isolation switch, a method for isolating
3 the bus device from the bus, the method comprising the steps:
- 4 (a) receiving a signal identifying a bus device to be isolated, the bus device
5 performing a bus transaction;
- 6 (b) receiving a bus status signal; and
- 7 (c) transmitting an isolation switch control signal responsive to both the received
8 device isolation signal and the received bus status signal.
- 1 20. The method of claim 19 further comprising the step of isolating the identified bus
2 device from the bus responsive to the received bus device isolation signal.
- 1 21. The method of claim 19 further comprising the step of inhibiting bus access.
- 1 22. The method of claim 19 further comprising the steps of:
- 2 (a) receiving a timeout signal; and
- 3 (b) resetting the bus responsive to receiving both the timeout signal and the bus
4 status signal indicating that the bus is not idle.
- 1 23. The method of claim 22 wherein step (b) comprises isolating the bus controller from
2 the bus.
- 1 24. An apparatus for isolating a device from a bus without interrupting system operation,
2 the apparatus comprising:
- 3 means for receiving a signal identifying a bus device to be isolated, the
4 identified bus device performing a bus transaction;
- 5 means for receiving a bus status signal; and

6 means for transmitting an isolation switch control signal responsive to both
7 the received bus device isolation signal and the received bus status signal.

1 25. The apparatus of claim 24 further comprising a means for isolating the identified bus
2 device from the bus responsive to the received bus device isolation signal.

1 26. The apparatus of claim 25 wherein the bus device isolation means comprises an
2 isolation switch.

1 27. The apparatus of claim 24 further comprising a means for inhibiting bus access.

1 28. The apparatus of claim 24 further comprising:

2 a timing means providing a timeout signal; and

3 a bus reset means resetting the bus responsive to receiving both the timeout
4 signal and the bus status signal indicating that the bus is not idle.

1 29. The apparatus of claim 28 wherein the bus reset means isolates the bus controller
2 from the bus.